

- 21 -

What is claimed is:

1           1. A method for automatically generating a framed digital image, comprising:  
2           analyzing a portion of a first data set representing rows and columns of pixels of an  
3           unframed digital image so as to identify at least one image characteristic for the digital  
4           image;  
5           determining at least one frame attribute based on the at least one image  
6           characteristic; and  
7           generating a second data set representing rows and columns of pixels of the framed  
8           digital image, the pixels defining a representation of the unframed digital image  
9           surrounded by a frame having the at least one frame attribute.

1           2. The method of claim 1, wherein the analyzing includes:  
2           mapping the pixels of the first data set to a two-dimensional image space; and  
3           selecting at least one region of the two-dimensional image space for analysis.

1           3. The method of claim 2, wherein the at least one region is a single region  
2           encompassing all pixels.

1           4. The method of claim 2, wherein each at least one region includes a subset of all  
2           pixels.

1           5. The method of claim 1, wherein the analyzing includes:

- 22 -

2 mapping the pixels of the first data set to a three-dimensional color space; and  
3 selecting at least one region of the three-dimensional color space for analysis.

1 6. The method of claim 5, wherein the selecting is performed in accordance with a  
2 principal component analysis technique.

1 7. The method of claim 5, wherein, for each region, the analyzing further includes:  
2 identifying at least one of a dominant color, a dominant lightness, a pixel  
3 concentration, a color space component volume, and a color space component density.

1 8. The method of claim 1, wherein the at least one image characteristic is selected  
2 from the group consisting of color temperature, contrast ratio, colorfulness, and color  
3 strength.

1 9. The method of claim 1, wherein the determining is further based on a  
2 predetermined relationship between at least some of the image characteristics and  
3 individual frame attributes.

1 10. The method of claim 1, wherein the determining further comprises:  
2 assigning the unframed digital image to an image category based on the at least  
3 one image characteristic; and  
4 choosing the at least one frame attribute based on the image category.

1 11. The method of claim 10, wherein the choosing further comprises:

- 23 -

2 mapping the image category to at least one framing rule for a corresponding at  
3 least one framing scheme parameter; and  
4 determining the at least one frame attribute according to the at least one framing  
5 rule.

1 12. The method of claim 10, wherein the image category is selected from the  
2 group consisting of portrait, landscape, floral, city, industrial, and night.

1 13. The method of claim 9, wherein one of the framing scheme parameters is color  
2 scheme, and wherein the at least one framing rule specifies a color scheme selected from  
3 the group consisting of same, similar, progressive, complementary, contrasting,  
4 achromatic, vivid, dark, and light.

1 14. The method of claim 9, including:  
2 modifying the predetermined relationship prior to the defining.

1 15. The method of claim 1, including:  
2 sending the second data set to an imaging device for producing the framed digital  
3 image.

1 16. The method of claim 1, wherein the representation of the unframed digital  
2 image is scaled in the framed digital image.

- 24 -

1           17. The method of claim 1, wherein the at least one frame attribute is selected from  
2     the group consisting of a border color, a border width, a border texture pattern, at least  
3     one shading color, and a number of borders per frame.

1           18. An image processing apparatus, comprising:  
2           an image analyzer adapted to receive and process a first data set having rows and  
3     columns of pixels representing an unframed digital image so as to define at least one frame  
4     attribute of a frame that is visually attractive to the unframed digital image; and  
5           a framed image generator communicatively coupled to the image analyzer for  
6     processing the first data set and the at least one image attribute so as to automatically  
7     generate a second data set having rows and columns of pixels representing a framed digital  
8     image including a representation of the unframed digital image surrounded by a frame  
9     having the at least one frame attribute.

1           19. The image processing apparatus of claim 18, the image analyzer further  
2     comprising  
3           a component identifier adapted to receive the first data set and identify at least one  
4     individual image component therefrom;  
5           a component characterizer communicatively coupled to the component identifier  
6     for determining at least one component characteristic for certain ones of the individual  
7     image components;

- 25 -

8           an image characterizer communicatively coupled to the component characterizer  
9   for determining at least one image characteristic from the at least one component  
10  characteristic; and  
11           an image categorizer communicatively coupled to the image characterizer for  
12  automatically defining the at least one frame attribute from the at least one image  
13  characteristic.

1           20. The image processing apparatus of claim 19, further comprising:  
2           a memory accessible by the image categorizer, the image categorizer automatically  
3   defining the at least one frame attribute in accordance with at least one framing scheme  
4   parameter stored in the memory.

1           21. The image processing apparatus of claim 20, wherein the memory is writeable,  
2   further comprising:  
3           a user interface communicatively coupled to the memory for modifying the at least  
4   one framing scheme parameter.

1           22. A program storage medium readable by a computing apparatus and embodying  
2   a program of instructions executable by the computing apparatus for automatically  
3   generating a visually pleasing framed digital image from an unframed digital image, the  
4   program storage medium comprising:

- 26 -

5 a first logical segment of the instructions configured to analyze a portion of a first  
6 data set representing rows and columns of pixels of the unframed digital image so as to  
7 identify at least one image characteristic for the digital image;

8 a second logical segment of the instructions configured to determine at least one  
9 frame attribute based on the at least one image characteristic; and

10 a third logical segment of the instructions configured to generate a second data set  
11 representing rows and columns of pixels of the framed digital image, the pixels defining a  
12 representation of the unframed digital image surrounded by a frame having the at least one  
13 frame attribute.